

WHAT IS CLAIMED IS:

1 1. A method of time scale modification of a digital
 2 audio signal comprising the steps of:
 3 analyzing an input signal in a set of first equally
 4 spaced, overlapping time windows having a first overlap amount
 5 S_a ;
 6 selecting a base overlap S_s for output synthesis
 7 corresponding to a desired time scale modification;
 8 calculating a cross-correlation $R[k]$ for index value k
 9 between overlapping frames for a range of overlaps between
 10 $S_s + k_{\min}$ to $S_s + k_{\max}$ according to
 11

$$12 \quad R[k] = \frac{\sum_{i=0}^{L_k-1} \{y[mS_s + i + k] \gg m\} \cdot \{x[mS_a + i] \gg m\}}{M_k}$$

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 14 where: L_k is the overlap length; m is a constant between 10
 15 and 15; and M_k is a measure proportional to overlap length;
 16 selecting a value K yielding the greatest cross-
 17 correlation value $R[k]$;
 18 synthesizing an output signal in a set of second equally
 19 spaced, overlapping time windows having a second overlap
 20 amount equal to $S_s + K$.

1 2. The method of claim 1, wherein:
 2 the measure proportional to the overlap length M_k is $L_k/2$.

1 3. The method of claim 1, wherein:
 2 the shift amount m is 12.

1 4. The method of claim 1, wherein:
 2 said step of calculating the cross-correlation $R[k]$
 3 employs only a center half of the overlap region for $k = 0$.

1 5. A digital audio apparatus comprising:
 2 a source of a digital audio signal;
 3 a digital signal processor connected to said source of a
 4 digital audio signal programmed to perform time scale
 5 modification on the digital audio signal by
 6 analyzing an input signal in a set of first equally
 7 spaced, overlapping time windows having a first overlap
 8 amount S_a ,
 9 selecting a base overlap S_s for output synthesis
 10 corresponding to a desired time scale modification,
 11 calculating a cross-correlation $R[k]$ for index value
 12 k between overlapping frames for a range of overlaps
 13 between $S_s + k_{\min}$ to $S_s + k_{\max}$ according to
 14

$$15 \quad R[k] = \frac{\sum_{i=0}^{L_k-1} \{y[mS_s + i + k] \gg m\} \cdot \{x[mS_a + i] \gg m\}}{M_k}$$

16
 17 where: L_k is the overlap length; m is a constant between
 18 10 and 15; and M_k is a measure proportional to overlap
 19 length;

20 selecting a value K yielding the greatest cross-
 21 correlation value $R[k]$,

22 synthesizing an output signal in a set of second
 23 equally spaced, overlapping time windows having a second
 24 overlap amount equal to $S_s + K$; and

25 an output device connected to the digital signal
26 processor for outputting the time scale modified digital audio
27 signal.

1 6. The digital audio apparatus of claim 5, wherein:
2 the measure proportional to the overlap length M_k is $L_k/2$.

1 7. The digital audio apparatus of claim 5, wherein:
2 the shift amount m is 12.

1 8. The digital audio apparatus of claim 5, wherein:
2 said digital signal processor is programmed to calculate
3 the cross-correlation employing only a center half of the
4 overlap region for $k = 0$.